

# Nu Quantum, pioneering quantum networking technology since 2018

*As part of our quick founder questions series – or QFQs – we spoke to Carmen Palacios-Berraquero, Founder and CEO of Nu Quantum about photonics, quantum networks and the opportunity for the UK to be a world leader in Quantum.*

Temps de lecture : minute

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## What was the catalyst for launching Nu Quantum?

I was actually encouraged to pursue an entrepreneurial path by the University of Cambridge's commercialisation team, who sensed that the technology that I had developed during my PhD in photonics could have a real impact in the quantum industry. I founded the company in 2018 and we're the world's first quantum networking company.

The catalyst was being invited to an accelerator programme in London for Series A companies, even though I hadn't even officially founded Nu Quantum yet – so I had to formalise that to take part! Soon, I realised that the fast pace of innovation and commercialisation thinking of a startup aligned with my strengths and interests, and it's been a fantastic journey since then.

# Tell us about the business – what it is, what it aims to achieve, who you work with, how you reach customers, and so on?

The promise of quantum computing is incredibly exciting, but solving these incredible computational problems requires systems that are thousands of times more powerful than those available today.

Our approach directly addresses this scaling challenge by building the hardware that will enable multiple quantum processors to be weaved together into a more powerful computational network, akin to how supercomputing clusters or high-performance data centres are built in the classical industry. We work with leading qubit companies to understand how to integrate our solutions into their computing systems, as well as end-users of quantum computing to understand the requirements and opportunities in the market.

## How has the business evolved since its launch?

We've always been in the business of quantum networks, but our initial focus was on developing quantum light source technology that could be applied to long-range communications.

About three years ago, we realised there was a huge gap in the market. Everyone's scaling strategy was to make their processors as big as possible, and then eventually networking multiple processors together to multiply their computational power. The catch was that everyone was focused on the first step: adding more qubits to their computer, but nobody was working on developing the networking hardware to weave them together. We realised that the technology and know-how that Nu Quantum had been building since our inception could be applied to solve

this problem and are now the category-creator in this space.

This market-led approach has been transformational to the business and has led to some very productive partnerships with leaders from both the quantum computing and classical networking industries, who are eager to work with us to enable the world's first distributed quantum computing systems.

## Tell us about the working culture at Nu Quantum?

Our success so far is truly down to our amazingly talented team. The technologies we are building are incredibly multidisciplinary, which means fostering an environment where people from very different backgrounds can come together. Almost half of our employees are women, and we have over 20 nationalities represented. We're also an LGBTQ-friendly workplace. It's important to me that everyone feels able to be themselves and voice their opinion at work, because our innovation is fuelled by constructive collaboration that only happens in a culture of authenticity and trust.

## How are you funded?

Our funding is a mixture of venture capital investment, grant funding, and contracts from Innovate UK and NSIFF. These have accelerated the progress of our technology, our commitment to delivering on-target, market validation of our approach, customers in mind. In November 2023, we raised a £8.5M pre-series A round from main investors Amadeus Capital Partners, Expeditions Fund, and IQ Capital.

# What has been your biggest challenge so far and how did you overcome this?

We are an early-stage company, and when we made the decision to move to networking it was a huge bet, nobody had gone for that yet. We knew there was market need for it, but that didn't guarantee it would be physically possible. Although we talk about the analogy to classical high-performance computers, the science is completely different, and the hardware did not exist yet.

There were three key questions when thinking about this. How do you connect a quantum processor to a quantum network, and can you do this with sufficient quality using an optical link? Then, can you actually route these light signals with high enough speed and fidelity to create useful quantum entanglement between different systems? And finally, even if you can connect everything together, will this hardware architecture even allow you to run quantum computing codes on it? I'm proud to say that Nu Quantum has made huge breakthroughs in each of these three areas by focusing on de-risking each technology block.

## How does Nu Quantum answer an unmet need?

Most quantum computing companies do not have a path to scale without interconnecting many processors together into a larger computing machine - and even for those that do, the path could be dramatically accelerated by networking. We were the first and one of the only quantum networking companies building full hardware solutions to tackle this problem.

Over the past five years, Nu Quantum has focused on tackling each of the core technological challenges that are associated with creating a

distributed quantum computing machine, as I described earlier. We launched the world's first Qubit-Photon Interface and Quantum Networking Unit, quantum analogues of a Network Interface Card and router, respectively. And we have an active theory team working on innovative quantum error-correction codes to run on our distributed architecture. The holistic systems-level understanding of the problem that we've built from maturing each of these core technologies over the past five years uniquely sets us apart from companies that have emerged or pivoted into this space.

## What's in store for the future?

One of our most exciting contracts is to build a multi-node distributed quantum computing system at the UK's National Quantum Computing Centre (NQCC). This will be a key milestone that represents the first industrial project specifically aiming to network quantum processors into a distributed system, setting both Nu Quantum and the UK apart. It's truly a privilege to be at this turning point in the industry, building the first-ever prototypes, and products of the technology that will enable quantum computing to scale.

## What one piece of advice would you give other founders or future founders?

It's important to have great people around you, with a team that is built on mutual respect and trust. I'm lucky that everyone I work with is an expert in their field, and it's important to me to create a platform for each team member to play to their strengths so that we can achieve more together. What we are doing is hard, so we need everyone to be honest about the challenges for us to address them together. Building an inclusive culture is key!

# And finally, a more personal question! What's your daily routine and the rules you're living by at the moment?

My daily routine keeps changing as I'm travelling a lot at right now, with the opening of our new office in the United States, speaking at conferences, and meeting with investors and collaborators around the world. Finding small moments to myself to recharge and have fun has been really important to me lately. Every founder knows things never stop being busy, and taking care of ourselves amidst the full calendar is key to staying sane! I love being in nature, in the water, in dance and music spaces, playing guitar and spending time with my friends and family.

Carmen Palacios-Berraquero is the Founder and CEO at [Nu Quantum](#).



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